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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,937	05/07/2007	**Yasuhiro Fukunaka**	512.46149X00	9912

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EXAMINER	
VAN, LUAN V	

ART UNIT	PAPER NUMBER
1724	

MAIL DATE	DELIVERY MODE
01/27/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,937	FUKUNAKA ET AL.	
	Examiner	Art Unit	
	LUAN V. VAN	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) *1-6* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

Applicant's amendment of January 12, 2011 does not render the application allowable. Claims 1-10 are pending in the application. Claims 1-6 have been withdrawn.

Status of Objections and Rejections

All rejections from the previous office action are maintained. New grounds of rejection under 35 U.S.C. 103(a) are necessitated by the amendments.

Claim Rejections - 35 USC § 102 and 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 7 and 8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Brumlik et al. ("Template Synthesis of Metal Microtubule Ensembles Utilizing Chemical, Electrochemical, and Vacuum Deposition Techniques," Accession Number: ADA274676, published by Defense Technical Information Center, January 11, 1994).

Regarding claim 7, Brumlik et al. teaches a process for manufacturing a metal nanotube comprising: a step for providing a film having a penetrated hole (i.e., holes in the microporous template membrane); a step of forming a cathode having a thickness of 20 nm and a pinhole (i.e., hole in the microporous template membrane after gold coating) on one surface of the film, wherein the pinhole is formed on the penetrated hole (page 6, first full paragraph); a step of filling an electrolyte solution containing metal ions

between the cathode and an anode and applying a voltage to electrolyze said electrolyte solution (page 6, first full paragraph), thereby electrochemically precipitating metal on the wall surface of said penetrated hole; and a step of immersing the film in a solvent to remove said film having a penetrated hole, thereby obtaining a metal nanotube (page 7, first full paragraph).

Brumlik et al. does not explicitly teach whether the cathode contacts the container or whether gases generated in the pinhole.

However, the step of contacting the surface of the cathode with a container can broadly encompasses other intermediaries such as a current collector 12 as shown in Fig. 4 of the applicant's drawings. Therefore, the Au/Al foil in combination with the clip as shown in the figures and disclosed on page 7 of Brumlik et al. broadly read on the step of contacting the cathode (i.e., evaporated gold film) with a container since the Au/Al foil and/or the clip is an extension of the container since it is holding the microporous membrane in place, and serves as an intermediary between the container and the cathode. Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have contacted the cathode with the container in order to hold the microporous membrane in the electrolyte solution.

Furthermore, it is the examiner's position that gas is inherently generated in the pinhole since the electric current is applied to the cathode (i.e., gold film) in the presence of an aqueous solution (i.e., containing water, see page 4). Electrolysis of water as a side reaction of the electroplating process inherently occurs in the aqueous solution, generating hydrogen gas in the pinhole.

Regarding claim 8, Brumlik et al. teaches wherein said thin metal film comprises gold (page 6, first full paragraph).

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brumlik et al. in view of Peng et al. ("Bismuth quantum-wires arrays fabricated by electrodeposition in nanoporous anodic aluminum oxide and its structural properties,"  Materials Science and Engineering B, Volume 77, Issue 3, 29 September 2000, Pages 246-249) and Tourillon et al. ("ChemInform Abstract: Electrochemically Synthesized Co and Fe Nanowires and Nanotubes," Electrochemical and Solid-State Letters, 3 (1) 20-23, 2000).

Brumlik et al. teaches the method as described above. Brumlik et al. differs from the instant claims in that the reference does not explicitly teach using the specific pH or voltage of the instant claim.

Peng et al. teaches an electrodeposition of Bi nanowires in an anodic aluminum oxide by adjusting the solution to have a pH of 3.0 (page 247).

Tourillon et al. teaches a method of electrochemically depositing Co and Fe nanowires in a nanoporous membrane using an initial overvoltage of -1.5 V followed by a lower potential at -0.8 V (Results and Discussion section).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the pH of Peng et al. and the voltage of Tourillon et al. in the method of Brumlik et al. in order to form nanotubes having the desired physical properties. Furthermore, it is understood to one having ordinary skill in the art that the

pH of the solution and the voltage of the electrodeposition process are result-effective variables that control the properties of the electrodeposit and the rate of electrodeposition. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have optimized the pH and the voltage of Brumlik et al. through routine experimentation to those of the instant claim in order to form nanotubes having the desired physical or mechanical properties.

Response to Arguments

Applicant's arguments filed have been fully considered but they are not persuasive. In the arguments presented on page 8-9 of the amendment, the applicant argues that Brumlik et al. does not disclose or suggests a method for producing a metal nanotube having a through hole because one end of the tube is closed. This argument is deemed to be unpersuasive, because claim 7 as presently written does not require that the nanotube is open on both ends. Therefore, since the microtubule of Brumlik et al. is a nanotube structure, even though one end of the tube is closed, it broadly reads on the metal nanotube of the instant claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUAN V. VAN whose telephone number is (571)272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Luan V Van/
Primary Examiner, Art Unit 1724
January 25, 2011